

Sacramento Nov 17th 53

S W Hall Esq

Dear Sir When I arrived in this State I found that the California Central RR at least that portion now under construction in all about 5 miles of Road covering the bridge across the American River had been let to one C. L. Wilson Co & by the said firm to a firm styled Cheney, Binney, Hausted & Taegle.

It is possible they are all neatly men but from my own observation I am of opinion there is a-d little money in the concern, Company Contractors & all. Be that as it may at one time I thought it probable I would build the bridge but I was determined to get ~~harnessed~~ into no "Prairie In China" Operation & hence kept out thus far - Mr Binney thinks a bridge upon your plan can be built for nothing &

No arrangement has been made with me for building the bridge as I am opinion that it will cost something to build a bridge upon ~~your~~ or any other plan of 212 ft span.

Mr Judah offered me a place as his assistant sometime back provided I would take my pay when it came from the company. Saying it came slow but was sure to come in the end.

This I did not think very flattering but accepted as I thought it better than doing nothing - This firm of Cady, Binney, Houston & Staegle were to have completed the 5 miles of road they had contracted to build on or before the 1st day of Oct¹⁸⁵⁸ but when the 15th of Oct came to behold they had not completed one mile of the work. ^{at any 1 pt -} Neither had they a stick of bridge timber on hand.

The rainy season was approaching & they wrote C L Wilson & Co (as Mr Staegle told me) that they would not go on unless he or Mr C would take the risk of the elements. Mr Judah determined to spring an arch

across the river from base to base of Pier strong enough to raise the bridge on & take out the false work. Binney & Co had raised their false work ^{or about 2/3 of it} you understand & had no get a stick of bridge timber on hand.

E. S. Wilson & Co undertook it to be carried on & built to the directions of the Engineer.

The Carpenter Cheney & Co had employed to get injured by the falling of a stick of timber where upon I took charge of the men at Mr Judah's request & raised the balance of the false work, drew the plans & made the calculations & laid out all the work & stood over & directed the carpenter in the building of the following ^{described} structure -

It was now the 23rd day of October & had been raining 2 days, Mr Judah was in San Francisco seeing what he could buy in the shape of timber - On returning he informed me he had bot a bill of 50,000 ft B.M of 3x12 plank from 20 to 30 ft long & said go ahead. I went ahead as follows On raising the false work we put on a bottom chord 2 plank thick & 2 plank

deep on either side of the posts putting the lower
edge of the chord at the elevation of the springing
line of the arch - Cut gaining 3" deep on either
side the posts. Our false work has a post
in the center of the bents & the bents are about
20 feet ^{times of by 6 ft high} apart. So we have three things of
bottom chord - The upstream & down stream
Chds each being 12x24 & the center 6x24 = 30x24
= 740 sq inches section

Our arches are 3 plank thick and either
side the post & 3 plank deep & are let in to the
posts by a 3" deep gain on either side -
The posts are 12x12 - cut 3" on each side ~~left~~
= 6x12 - This space received 2 pr of tension
braces between each ² bents of false work
~~and~~ the said tension braces passed down
into the space in the bottom chord & are
secured with 9" boat spike & 3/4" bolts & spike
& 2 bolts at each connection -
the arch is filled solid for 40 ft from
the butt or landing or springing line, 1/2 half
filled for the next 20 feet & then left hollow
for about 20 feet & filled solid for 40
feet at the crown the butt of the arch is
made 6" thicker for 30 feet than the balance
so we have 3 arches or trusses the arch of
which 30"x24" for 30 feet from the butt
then 24"x24" for the next 10 feet then 21"x24"
for 22 feet then 18"x24" for about 22 feet
then 24"x24" for about 21 = 105 feet the distance
from butt to crown of arch by 2 = 210 feet = span
of arch - The toe of the arch rests on an 8" wide

2nd Chut

step at the base of the piers. We have a top Chord running from the head of the 1st bent to the head of the 4th bent where it strikes the arch & may be considered as continued in the arch to the crown as the arch is filled solid from the pt where the top chord strikes or joins it to the crown. The top Chord consists of 3-3" plank on either side of the posts & is one plank deep making a chord in effect 12x12 - an arch brace 10x10 is put up at each end of the span the ft of said brace resting on the top of the arch & butting against the masonry & running to the head of the 1st bent from either pier where it is received by & connected with the top chord - The arch is tied together by a block 3x12 & 2ft long being placed vertically on each post & pr of tensioned braces & spiked with Mt spike 6" to 9" long & bolted with 3-3/4" bolts at each connection - The entire structure is put together with Mt spike, carriage bolts 7" to 10" long & the 3/4" round iron bolts

before said.

For work men he had all classes of men except Chinamen, & negro's. -

He had Irish, Dutch, Scotch, Welch, Swedes, Spaniards, Englishmen & men from almost all parts of the U.S. & yet never at any one time had more than 25 men in employ -

neither had he ever more than 7 or 8 carpenters & only three or 4 of them possible mechanics.

He had, blacksmiths, one & one machinist, Paddy Irish rail roaders & cabinet makers, Ship carpenters & hatchmakers & what he did not have need not be employed.

He commenced the work on the 23^d day of Oct & on the 15th day of November at 2, O'clock P.M., I commenced lifting the arch into its bearings by taking out the dges which had been placed under the posts & in 55 $\frac{1}{2}$ minutes the structure was in its bearings & settled only 1" at the center -

The cross section of the arch at its weakest point viz 24ft either way from the crown is $18 \times 24 \times 3 = 1296$ sq inches
at the crown = $24 \times 24 \times 3 = 1728$ sq inches -

at the butt or springing line is $30 \times 24 \times 8 +$
 $24 \times 24 \times 8 = 2080$ sq inches -

Query? Where is the weakest point
in our arch? - Is it at the crown
where it is filled solid for 2 ft each
way in line of arch or is it at some
point in the next 22 feet where it is
left open that is with a 8×40 ft space in
center - Is it symmetrical -

What do you think of spike connections?
What do you think of an old falsework
so patched up that when the lower
ends of the posts are removed & a clear
span of 210 feet is left dangling over
thin California air it settles only
1 inch at the center —

